

18. Illustrate the Tricarboxylic Acid Cycle with a neat labeled diagram and explain its role in metabolism.
 19. Summarize the Calvin Cycle and its importance in microbial photosynthesis.
 20. Explain the different modes of reproduction in microalgae.
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NOVEMBER/DECEMBER 2025

23UMB21 — MICROBIAL PHYSIOLOGY AND METABOLISM

Time : Three hours

Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.



1. Define batch culture.
2. Illustrate with a diagram of the typical bacterial growth curve
3. Classify microorganisms based on nutritional requirements.
4. List any two factors affecting microbial growth.
5. Discuss the difference between the Embden—Meyerhof and the Entner—Doudoroff pathways.
6. Justify the significance of the electron transport chain in ATP synthesis.
7. Identify the major photosynthetic pigments in microbes.

8. Which enzyme is responsible for CO₂ fixation in the Calvin cycle?
9. Define binary fission.
10. Name two types of fungal asexual spores.

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) Explain continuous culture with its applications.

Or

- (b) Analyze the different methods of microbial growth measurement.

12. (a) Compare photoautotrophs and chemoorganotrophs with examples.

Or

- (b) Explain passive diffusion and active transport mechanisms in microbial nutrition uptake.

13. (a) Illustrate the steps of the Pentose Phosphate Pathway and state its significance.

Or

- (b) Summarize different types of fermentation with examples.

14. (a) Explain the structure of the chloroplast and its role in photosynthesis.

Or

- (b) Distinguish between cyclic and non-cyclic photophosphorylation.

15. (a) Compare asexual and sexual reproduction in fungi.

Or

- (b) Describe endospore formation in bacteria with a diagram.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Evaluate the physical and chemical methods for the control of microbial growth.
17. Analyze the nutritional classification of microorganisms with suitable examples.